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| 10/526,205 | 03/01/2005 | Hideo Yoshida | F-8601 | 4976 |

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| EXAMINER | |
|---|---|
| LEADER, WILLIAM T | |

| ART UNIT | PAPER NUMBER |
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| 1795 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/526,205 | YOSHIDA ET AL. | |
| | Examiner | Art Unit | |
| | WILLIAM T. LEADER | 1795 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *10-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/1/05; 6/15/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. Applicant's election of Group I, claims 1-9, in the reply filed on June 15, 2009, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 10-14 are withdrawn from consideration.

### *Information Disclosure Statement*

2. The information statement submitted on June 15, 2009, listed Jp-1457588. A copy of this reference was not received. Rather a copy of EP 1 457 588 was included. This EP document has been cited on the attached PTO-891.

### *Specification*

3. The disclosure is objected to because of the following informalities: In numerous instances the specification refers to "pores". A "pore" is defined as "any minute surface opening or passageway" (The American Heritage Dictionary of the English Language). However, the specification also refers in numerous instances to "pours". "Pour" is a verb meaning "to make a liquid or granular solid stream to flow" or a noun meaning "a pouring or flowing forth" (The American Heritage Dictionary of the English Language). It appears that in the context of applicant's specification most, if not all, instances of "pour" should be changed to "pore".

Appropriate correction is required.

***Drawings***

4. The drawings are objected to because the legends in figures 6, 7 and 8 include "carrlage". "Carrlage"does not appear in The American Heritage Dictionary of the English Language, and is not considered to be an English word. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 1 is directed to an anodic oxidation method for electrolyzing an object. Claim 1 recites that a "sealing suppressing ion" of an oxide film is mixed into the electrolyte solution. The scope of "sealing suppressing ion" is not clear. Initially, it is not clear what is being sealed. Applicant's specification refers to "the sealing treatment of pores" (see, for example, paragraph [0076]). However, the claim does not recite the formation of pores.

8. Additionally, it is not clear by what mechanism or reaction sealing occurs. The text *Electroplating* by F. A. Lowenheim, describes a process for the production of an anodic oxide coating on aluminum in which a porous layer of oxide is formed. Lowenheim explains that the utility and performance of anodic coatings on aluminum often depend upon the type and quality of postanodizing treatment employed. "The term *sealing* generally denotes a treatment which renders the coating nonabsorptive or introduces into the coating a material that enhances or modified the characteristics of the anodic coating." Lowenheim discloses that one method sealing is to subject the anodic coating to pure water at elevated temperatures where the water reacts with the surface of the aluminum oxide by the reaction $Al_2O_3 + H_2O \rightarrow 2AlOOH$. See page 463. Lowenheim also discloses sealing by using a wax, by applying a lacquer, or by impregnating with an organic material in the vapor phase. See page 466.

9. It appears that the only sealing described in applicant's specification is the sealing of pores in an aluminum oxide film formed by anodic oxidation. A hydration reaction under the

pressure and heating of carbonic water generates a hydrate in the pores. The hydrate grows or expands to block or reduce the pores, thus effecting the sealing treatment (paragraph [0090]). However, claim 1 does not recite a hydration reaction. Since in claim 1 it is not clear what is being sealed or in what way sealing occurs, it is not possible to determine what ions would suppress sealing.

10. Claim 4 recites the limitation "said pores" in line 4. There is insufficient antecedent basis for this limitation in the claim. No pores have been previously recited.

11. Claim 5 recites the limitation "the pores" in line 2. There is insufficient antecedent basis for this limitation in the claim. As noted, no pores have been previously recited.

12. Claim 7 recites "dissolving a water in a supercritical or subcritical carbon dioxide". Claim 7 is dependent on claim 1 which recites "dissolving a pressurized carbon dioxide in the predetermined quantity of water". The limitation of claim 7 is not clear since it is not apparent that the limitation of claim 7 where water is dissolved in carbon dioxide is compatible with the limitation recited in claim 1 which claim 7 necessarily incorporates. Claim 9 recites a limitation similar to that of claim 7, while independent claim 8 recites a limitation similar to that of claim 1.

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for suppressing the sealing of pores in an aluminum oxide layer by

suppressing a hydration reaction using chloride or fluoride ions, phosphoric ion ($PO_4^{3-}$) or the radical of sulfuric acid ($SO_4^{2-}$) does not reasonably provide enablement for the selection of ions that can be used to suppress sealing of other materials by other mechanisms. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. Applicant's specification provides no guidance as to suppressing sealing of materials other than a porous aluminum oxide layer, or as to suppressing sealing when sealing occurs other than by a hydration reaction. Additionally, other than listing four specific ions, applicant provides no teaching as to how one of ordinary skill in the art would determine what ions would be effective in suppressing sealing of porous aluminum oxide by hydration.

***Claim Rejections - 35 USC § 102***

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by UK patent 706,739 to the Glen L. Martin Company.

17. The UK patent is directed to an anodic oxidation method. An aluminum workpiece is made the anode in an electrolytic cell having a lead cathode and an aqueous electrolyte. The desired oxide coating is produced on the workpiece by passing an electric current having a suitable voltage and current density with the workpiece as the anode. See page 1, lines 57-71.

The electrolyte may be formulated by introducing carbon dioxide gas under pressure through a series of orifices located throughout the plating tank at a rate so as to insure an excess of carbon dioxide. See page 2, lines 30-65. The electrolyte additionally contains sulfuric acid. See page 2, lines 77-80. The sulfuric acid would provide $SO_4^{-2}$ ions. As indicated in paragraph [0066] of applicant's specification, these ions function to suppress sealing. All limitations recited in applicant's claim 1 are met by the '739 patent.

18. With respect to claim 2, applicant discloses that sealing occurs during anodizing, and that sealing is suppressed by inclusion of a sealing suppressing ion in the anodizing electrolyte. Sealing and sealing suppressing would occur in the process of the '739 patent in the same manner it does in applicant's claimed process.

19. With respect to claim 3, the presence of a sealing suppressing ion in the process of the '739 patent would have controlled sealing in the same manner it does in applicant's claimed process.

20. With respect to claim 4, the workpiece of the '739 patent is immersed in the anodizing electrolyte solution for a predetermined time. Pores would have been enlarged in the same manner as in applicant's claimed process.

21. With respect to claim 5, the '739 patent teaches that the coating may be dyed. See page 2, lines 125-129.

22. Claim 6 is interpreted as limiting the catalyst pieces recited in claim 5, line 4 to powdery titanium or titanium alloy. However, the recitation of catalyst pieces in claim 5 is alternative to

precipitating a dye. As noted in the previous paragraph, the '739 patent teaches that the coating may be dyed.

23. Claim 7 recites a supercritical or subcritical carbon dioxide. The critical point is defined by the critical pressure and the critical temperature. For carbon dioxide the critical pressure is 72.9 atm/7.39MPa, while the critical temperature is 31.1°C. Carbon dioxide is considered to be in a supercritical state when its pressure is above the critical pressure and the temperature is above the critical temperature. Carbon dioxide is considered to be in a subcritical state when the pressure or temperature is below the critical value. The electrolyte of the '739 patent is in a subcritical state.

***Claim Rejections - 35 USC § 103***

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

25. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

26. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over UK patent 706,739 to the Glen L. Martin Company in view of either of Crouse et al (US 6,869,671) or Mahulikar et al (US 5,608,267)..

27. Claim 8 differs from the process of the UK '739 patent by reciting that the workpiece being anodized is made of titanium or titanium alloy rather than aluminum. The Crouse et al patent discloses a process including aluminum anodization in sulfuric acid. See the abstract. Crouse teaches that valve metals other than aluminum, such as Ti, Cr and Ta, may also be anodized in aqueous acidic solutions such as sulfuric acid (column 6, lines 3-7).

28. The Mahulikar et al patent is directed to a process for making a semiconductor package with a thermal dissipator which includes anodizing. See the abstract. Mahulikar teaches that the thermal dissipater may be made of aluminum or aluminum alloy (column 4, lines 18-20) or other light weight metal such as titanium. Titanium is anodized by many of the same commercial solutions, containing sulfuric acid, used to anodize aluminum (column 7, lines 46-55).

29. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized the sulfuric acid anodizing process of the '739 patent to anodize a titanium workpiece rather than an aluminum workpiece because it is known in the art that the same sulfuric acid-based electrolytic solution may be used to anodize both aluminum and titanium as shown by Crouse et al or Mahulikar et al.

30. With respect to claim 9, as noted above the electrolyte of the '739 patent is in a subcritical state.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Leader/
July 31, 2009

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795